

AMENDMENTS TO THE SPECIFICATION

IN THE ABSTRACT OF THE DISCLOSURE:

Replace the Abstract of the Disclosure currently of record with the attached new Abstract of the Disclosure.

--A method for producing a color filter includes forming a resinous black matrix on a substrate, and bonding a color film to the substrate and the resinous black matrix. The edge of the matrix is made thinner than an adjoining portion of the matrix to reduce or eliminate foaming and discoloration.--

IN THE SPECIFICATION:

Page 11, please amend the first paragraph as follows:

In the light of the above problems, the present invention has been achieved. ~~A main object of the~~ The present invention is to provide a method of manufacturing a color filter hardly causing reduces discoloration of colored layers ~~8 to be subject to discoloration~~ at local portions close to the resinous black matrix material ~~12 despite of a simple method including a step of which otherwise might result from~~ initially forming resinous black matrix material ~~12~~ and ~~an ensuing step of pasting it over the~~ colored layers 8. ~~Another object of the~~ The present invention is to further provide a color filter hardly causing may also reduce discoloration of colored layers 8 ~~to be subject to discoloration~~ at local portions close to the resinous black matrix material ~~12~~. ~~A still further object of the~~ The present invention is to provide encompasses a display device incorporating the color filter manufactured by implementing the inventive method ~~described above~~.

Page 11, second paragraph, please amend as follows:

~~To achieve the above objects, according~~ According to one aspect embodiment of the present invention, a method for fabricating a color filter by bonding a colored film on a substrate having a resin black matrix formed thereon includes the step of: forming beforehand a height difference in the resin black matrix so that an edge portion of the resin black matrix located on

the upstream side with respect to the direction in which the colored film is bonded is made lower than the other portion of the resin black matrix.

Page 11, third paragraph bridging pages 11 and 12, please amend as follows:

According to this method, when the colored film ~~overleaps~~ overlaps an edge of the resinous black matrix material, it is possible to ~~induce~~ force atmospheric air away from the surface of the substrate to the upper portion of the edge of the resinous black matrix material, thereby preventing foaming phenomenon from being generated at the interface between the substrate, the resinous black matrix material, and the colored film, or ~~making it possible to lower the occurrence of~~ at least reducing the foaming phenomenon. Even if ~~the~~ some foaming has been generated at the interface ~~between them~~ with the substrate, inasmuch as the height of the edge portion of the resinous black matrix material is lower than that of other portions, only a negligible amount of the foaming will be generated, and ~~further, even the discoloration may be generated within a very narrow range~~ will be minimized.

Page 12, second full paragraph, please amend as follows:

According to another ~~aspect~~ embodiment of the present invention, in a color filter provided with a substrate, a resin black matrix formed on the substrate and having an opening, and a colored film laid so as to cover from

over the portion of the substrate located inside the opening of the resin black matrix to over the resin black matrix, an edge portion of the resin black matrix located along the opening and under the colored film is made lower than the adjacent portion of the resin black matrix ~~contiguous with the edge portion~~. This color filter can be manufactured by applying the above-specified method. Accordingly, it is possible to prevent discoloration from being generated otherwise caused by occurrence of foaming phenomenon.

Page 13, fourth full paragraph, please amend as follows:

FIG. 6A to FIG. 6G schematically illustrate ~~serial a~~ processes for manufacturing a color filter according to one of ~~practical forms for~~ implementing embodiment of the present invention;

Page 13, fifth full paragraph, please amend as follows:

FIG. 7A to FIG. 7G schematically illustrate ~~serial a~~ processes for manufacturing a color filter according to another ~~practical form for~~ implementing embodiment of the present invention;

Page 13, sixth full paragraph, please amend as follows:

FIG. 8A to FIG. 8G schematically illustrate ~~serial a~~ processes for manufacturing a color filter according to another ~~practical form for~~ implementing embodiment of the present invention;

Page 13, the last paragraph bridging pages 13 and 14, please amend as follows:

FIG. 9A to FIG. 9G schematically illustrate ~~serial a~~ processes for manufacturing a color filter according to a still further ~~practical form for~~ implementing embodiment of the present invention;

Page 13, last paragraph bridging pages 13 and 14, please amend as follows:

FIG. 10A and FIG. 10B schematically illustrate a plan view and a cross-sectional view, respectively, of the completed form of a color filter secured by implementing an embodiment of the present invention;

Page 14, first full paragraph, please amend as follows:

FIG. 11A and FIG. 11B illustrate schematic views of specific ~~constitutions~~ structures of LCD devices incorporating a color filter ~~secured by~~ implementing manufactured according to an embodiment of the present invention;

Page 14, second full paragraph, please amend as follows:

FIG. 12A and FIG. 12B illustrate schematic views of other specific constitutions of LCD devices incorporating a color filter secured by implementing an embodiment of the present invention;

Page 14, third full paragraph, please amend as follows:

FIG. 13A and FIG. 13B illustrate a plan view and a cross-sectional view, respectively, for schematically showing the completed form of a color filter ~~secured by implementing an embodiment of~~ prepared by a process according to the present invention, which incorporates a resinous black matrix in the peripheral portions and inside of pixels;

Page 14, fourth full paragraph, please amend as follows:

FIG. 14A and FIG. 14B schematically illustrate specific ~~constitutions~~ examples of LCD devices incorporating the color filter shown in FIG. 13A and 13B;

Page 14, fifth full paragraph, please amend as follows:

FIG. 15A and FIG. 15B schematically illustrate a plan view and a cross-sectional view, respectively, of a color filter ~~secured~~ prepared by ~~implementing~~ a process according to the present invention, in which edges with a height

lower than that of other portions of the resinous black matrix are disposed on both sides thereof; and

Page 14, sixth full paragraph, please amend as follows:

FIG. 16A and FIG. 16B schematically illustrate specific ~~constitutions~~ examples of LCD devices incorporating the color filter shown in FIG. 15A and 15B.

Page 14, the last paragraph bridging pages 14 and 15, please amend as follows:

FIG. 5 schematically illustrate the principles for causing foaming phenomenon to be prevented ~~from being generated~~ at the interface between the substrate, the resinous black matrix, and the colored film as previously arranged by the present invention. As is clear from the comparison between the conventional system shown in FIG. 4 and the inventive system shown in FIG. 5, ~~by way of lowering~~ the height of an edge portion 13 of the resinous black matrix 12 is lower than that of other portions, ~~compared to the case in which height difference does not exist, it is understood that~~ As a result, foaming can ~~hardly occur when a height difference is provided in the resinous black matrix 12~~ is reduced or eliminated. According to the inventive system shown in FIG. 5, it is possible to guide a any foam ~~11 about to~~ that might be generated on a substrate 3 to a portion right above the edge 13 of the resinous

black matrix 12. Note that the foam in area 11 led onto the edge portion 13 of the resinous black matrix 12 does not generate adverse influence over the peripheral portions.

Page 18, the second paragraph, please amend as follows:

Constitutions of LCD devices incorporating the above-referred color filter are schematically shown in FIG. 11A and 11B. FIG. 11A presents an example of applying a number of plastic beads 18 for securing thickness of a liquid crystal layer 7. FIG. ~~4B~~ 11B presents an example of adhering a plurality of pillars 18a to an orientation film 17 on the part of an opposite transparent electrode 16 so as to secure thickness of the liquid crystal layer 7. Note that the reference numeral 5 represents an insulating film, 6 represents a pixel electrode, 10 represents a gate wiring, and 19 represents an interlayer insulating film.

Page 19, the second full paragraph, please amend as follows:

~~Not~~ The invention is applicable to not only the above-cited circular form or square form, but ~~the practical form of minute openings 15 formed in mask may~~ also be to openings of elliptic form or polygonal form ~~except for~~ in addition to the square form, or to any form close to them suitable configurations.



Page 19, the third full paragraph, please amend as follows:

~~Not only against those portions in the periphery of pixels, but the~~ The present invention is also applicable to cope with over-ride phenomenon of colors inside of pixels. For example, as shown in FIG. 13A and FIG. 13B, in the case in which a discrete portion of the black matrix fully surrounded by other portions of the black matrices (fully dissociated from other portions) exists, as in the case of peripheral black matrix, when a color film rides over this portion of the black matrix, foaming occurs. ~~To cope with this, by way of arranging to previously reduce~~ In this situation the height of the edge portion 13 of this discrete portion of the black matrix 12 is reduced to be thinner than other portions. ~~and then paste~~ When the colored layer 8 is applied by ~~applying~~ the DFL method, ~~it is possible to prevent~~ foaming is prevented as discussed above ~~phenomenon from occurrence~~. FIG. 14A and 14B schematically exemplify the constitutions of the LCD devices incorporating the color filter shown in FIG. 13A and 13B.

Page 20, first full paragraph, please amend as follows:

In the above embodiments, it is so arranged that only the edge portion 13 on one side of the resinous black matrix 12 is lowered ~~than~~ with respect to other portions. However, as shown in FIG. 15A and 15B, it is also allowable to lower edges 13 on both sides ~~to be lower than other~~ of respective black matrix portions. By implementing this arrangement, ~~not only in one direction, i.e., in~~

~~the arrowed direction A,~~ but it is also possible to paste the colored layers 8 in the inverse direction indicated by the other arrowed line A' as well as in the direction of arrow A. In consequence, even when disposing the substrate 3 loaded with the resinous black matrix 12 in ~~the direction~~ an inverse from direction into a laminating unit, it is possible to prevent foaming ~~from occurrence,~~ and ~~further,~~ improve the yield rate. ~~Thus, Further,~~ it is no longer necessary to regulate the installing direction of the substrate 3 ~~at a specific direction,~~ thus promoting efficiency of the laminating process. Examples ~~Constitutions~~ of the inventive LCD devices incorporating the color filter exemplified in FIG. 15A and 15B ~~is~~ are schematically shown in FIG. 16A and 16B.

Page 20, the second full paragraph, please amend as follows:

This specification has ~~exemplified the~~ referred to LCD devices ~~device~~ as products ~~an applicable object~~ of the present invention. However, ~~a~~ the color filter may be applied in accordance with the ~~secured by implementing the~~ ~~above-described~~ manufacturing method ~~related to~~ of the present invention ~~is~~ ~~also compatibly applicable~~ to other display devices ~~differing in the display principles~~ such as a plasma display device ~~for example~~.

Page 20, the third full paragraph, please amend as follows:

As is apparent from the above description, the present invention may also be implemented by way of ~~adding a variety of~~ modifications or changes within the scope of the amended claims without diverging from the essentials ~~as defined in the following Claims and further without necessarily being bound by the contents of~~ set forth in the above description.